

## Section 1.5 - Inequalities

### Interval Notation?

(a)  $x > 4$

(b)  $x \geq 4$

(c)  $x < 4$

(d)  $x \leq 4$

example 1:

Translate to an inequality:

5 fewer than a number is at least 12.

Bellwork: 9/20/12

Solve, graph, interval notation

$$\begin{array}{r} 3x + 17 \geq 5 \\ -17 \quad -17 \end{array}$$

$$\begin{array}{r} \hline 3x \geq -12 \\ \hline 3 \quad \quad 3 \\ \hline x \geq -4 \end{array}$$

$$[-4, \infty)$$



the quotient of a number and 3 is  
no more than 15.

$$\cancel{(3)} \frac{x}{\cancel{3}} < 15(3)$$

$$x < 45$$



$$\text{IN:} \\ (-\infty, 45)$$

example 2:

Solve, graph, interval notation.

$$\begin{array}{r} -3(2x-5) + 1 \geq 4 \\ \phantom{-3(2x-5)} \quad -1 \quad -1 \\ \hline \end{array}$$

$$-3(2x-5) \geq 3$$

$$-6x + 15 \geq 3$$

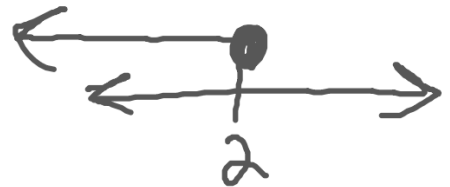
$$\phantom{-6x} \quad -15 \quad -15$$

$$x \leq 2$$

$$\begin{array}{r} -6x \geq -12 \\ \hline \phantom{-6x} \quad -6 \quad -6 \end{array}$$

IN:

$$(-\infty, 2]$$



$$2(4x+1) + 3 > -3$$

example 3:

$$14 < x$$

$$x > 14$$

A movie rental program offers two subscription plans. You can pay \$36 a month & rent as many movies as you like or you can pay \$15 a month plus \$1.50 per movie. How many movies must you rent in a month for the first plan to cost less than the second plan?

You must rent at least 15 movies for the 1st plan to cost less than 2nd plan.

$$\begin{array}{rcl} 36 & < & 15 + 1.50x \\ -15 & & -15 \\ \hline 21 & < & 1.50x \\ \underline{1.50} & & \underline{1.50} \end{array}$$

example 4: sometimes, always, or never?

$$\textcircled{a} \quad -2(3x+1) > -6x+7$$
$$\begin{array}{r} -6x-2 > -6x+7 \\ +6x \quad +6x \end{array}$$

$-2 > 7$   
NEVER

$$\textcircled{b} \quad 5(2x-3)-7x \leq 3x+8$$
$$\begin{array}{r} 10x-15-7x \leq 3x+8 \\ 3x-15 \leq 3x+8 \\ -3x \quad -3x \end{array}$$

ALWAYS  $-15 \leq 8$

$$\textcircled{c} \quad 6(2x-1) \geq 3x+12$$
$$\begin{array}{r} 12x-6 \geq 3x+12 \\ -3x \quad -3x \end{array}$$

$$\begin{array}{r} 9x-6 \geq 12 \\ +6 \quad +6 \end{array}$$

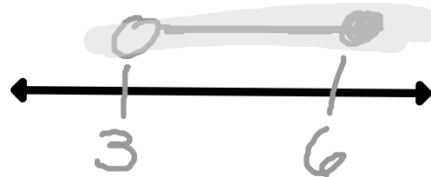
$$\begin{array}{r} 9x \geq 18 \\ \frac{9}{9} \quad \frac{9}{9} \end{array}$$

$x \geq 2$   
SOMETIMES



example 5: and vs. or (interval notation)

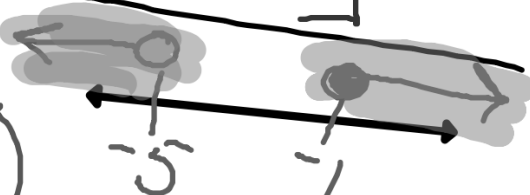
①  $7 < 2x + 1$  and  $3x \leq 18$   
 $\frac{-1}{-1} \quad \frac{-1}{-1}$   
 $\frac{6 < 2x}{2} \quad \frac{3x \leq 18}{3}$   
 $3 < x$   
 $x > 3$   
 $x \leq 6$



IN:

$(3, 6]$

②  $7 + k \geq 6$  or  $8 + k < 3$   
 $\frac{-7}{-7} \quad \frac{-7}{-7}$   
 $\frac{7 + k \geq 6}{-7} \quad \frac{8 + k < 3}{-8}$   
 $k \geq -1$   
 $k < -5$



IN:  
 $(-\infty, -5) \cup [-1, \infty)$

Homework: 9/20/12

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EVEN S

ONLY

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